DoD Space Planning Criteria for Health Facilities
Radiology and Nuclear Medicine

5.4.1. PURPOSE AND SCOPE:

This section specifies the space planning criteria for the Radiology, Radiotherapy, and Nuclear Medicine Service in DoD medical facilities.

The Radiology Department as used in this criteria includes all diagnostic imaging modalities (i.e. Radiology, Fluoroscopy, Computed Tomography, Magnetic Resonance Imaging (MRI), Ultrasound, etc.). Criteria is provided for the radiology service and for satellite locations such as emergency medicine, orthopedics, etc. It does not include such systems as cardiac catheterization and urological systems normally found in other departments. These systems will be found in the space planning criteria for the applicable department.

The Radiotherapy Department in this criteria includes all treatment modalities (i.e. Linear Accelerator, etc.).

The Nuclear Medicine Service includes provision of space for specialized measurement equipment and environments necessary to use radioisotopes in the diagnosis and treatment of patients.

5.4.2. DEFINITIONS:

Radiology:

Angiography System - A specialized radiographic/fluoroscopic system with expanded capabilities for performing angiography procedures.

Computed Radiography (CR) - Using a traditional exposure unit that uses film, a special reusable cassette captures the image and a CR reader unit digitizes the image and sends it to the appropriate workstation or to storage.

CT Scanner - A Computed Assisted Tomography Scanner (CT) is an x-ray system that produces an axial (cross sectional) image of the anatomy being studied. The CT image is a computer calculated composite of numerous short exposures taken from various angles in a circle around the anatomy of interest. As the image is computer calculated, an image or a series of images may be manipulated to produce different views of the area of interest and to "window" out interfering structures such as bone. The "window" capability allows the radiologist to selectively view either dense tissues such as bones or to view diffuse tissues such as the heart or brain.

Direct Radiology - An image is taken, verified and transmitted within the exposure room (R/F rooms).

Diagnostic Radiology - There are three general systems grouping, although these may be mixed:

1. A film based system with darkrooms and film storage has been the conventional system.
2. A totally digital system is one in which the radiology exposure device generates a digital image that can be: a. read as a digital image or stored in digital form immediately, or
   b. stored “film” (hard-copy).
3. A computed radiology system is one in which a special cassette is substituted for the film cassette. This special cassette is then placed in a CR reader and a digital image is generated.

Diagnostic Room - Any room in the Radiology Department containing imaging equipment such as radiographic, radiographic/fluoroscopic, MR, angiography, CT, ultrasound system, etc.

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Digital Radiography - The capture or conversion of radiography images in a digital format.

General Purpose Radiograph - A radiographic system designed primarily to perform general radiographic procedures.

Magnetic Resonance Imaging (MRI) - is a technique to produce computer calculated images of human anatomy using a very high strength magnetic field. The scanner gantry incorporates a high strength magnet, radio frequency transmission coils, and signal acquisition coils.

Picture Archiving and Communications System (PACS) - A PACS consist of workstations for interpretation; imaging modalities that gather Radiography, Fluoroscopy, Angiography, Ultrasound, Nuclear Medicine, CT, and MRI data; a web server for distribution; printers for file (which must still be generated, in limited amounts, for the use of those without access to the network); image servers to transfer and hold information within the PACS; an archive of off-line information. A network is needed to reach each of these devices.

Radiographic/Fluoroscopic System - A system designed to produce radiographs or real time motion, plus real time images via direct viewing or a television monitor. The real time images can be recorded for later viewing.

Specialized Radiographic System - A radiographic system designed primarily to perform a specific type of radiographic procedure.

a. **Dedicated Chest System** - A radiographic system designed to perform upright chest examination.

b. **Tomography System** - A radiographic system designed to perform laminography studies. This is an option to a radiographic/fluoroscopic room.

c. **Mammography System** - A radiographic system designed primarily to perform mammographic examinations.

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Nuclear Medicine (the following terms are generally used in reference to Nuclear Medicine and Radiotherapy services):

Cold- Refer to an area, which should be free of radiation. The designations of hot and cold are made to separate potentially radioactive patients from other patients.

Bone Densitometer - measure bone mineral density. It will also compare this measurement to a reference population based on age, weight, sex, and ethnic background.

Dosimetrist - A member of the radiation oncology team who has knowledge of the overall characteristics and clinical relevance of radiation oncology treatment machines and equipment, is cognizant of the procedures commonly used in brachytherapy and has the education and expertise necessary to generate radiation dose distributions and dose calculations in collaboration with the medical physicist and the radiation oncologist.

Dual Photon Bone Mineral Absorptiometry Scanning Room - Room for performing bone densitometry (osteoporosis tests).

Hot- Refers to an area where radiation may be present. For example a "hot" toilet is reserved for patients who have been given a radioactive substance and who are considered radioactive themselves. There are also "hot" waiting rooms. (See Cold).

Linear Accelerator (LINAC) - In the health care setting, a linear accelerator is the device most commonly used for external beam radiation treatments for patients with cancer. It delivers a uniform dose of high-energy x-ray to the region of the patient's tumor. These x-rays can destroy the cancer cells, while sparing the surrounding normal tissue. The linear accelerator uses microwave technology to accelerate electrons and then allows these electrons to collide with a heavy metal target. As a result of these collisions, high energy x-rays are scattered from the target. A portion of these x-rays is collected to form a beam that matches the size and shape of the patient's tumor. The beam comes out of a part of the accelerator called a gantry, which rotates around the patient.

Nuclear Medicine - A medical specialty that uses liquid and gaseous radioactive materials (or radiopharmaceuticals) to diagnose and treat various conditions. Nuclear Medicine is also the diagnostic (in vivo and in vitro) and therapeutic use of unsealed radioisotopes (gasses and liquids).

Radiopharmaceuticals- Pharmaceuticals that have a radioactive component. These localize in the body based on their physical or chemical properties. The radiopharmaceuticals used in diagnostic nuclear medicine emit gamma rays that can be detected externally by special types of cameras: gamma or TET cameras. Therapeutic nuclear medicine uses substances that emit beta radiation which can kill targeted cells within the body.

Radiotherapy – also called radiation therapy, is the treatment of cancer and other diseases with ionizing radiation. This is a high-energy ray, usually x-rays, used to kill cells, usually cancer cells.

Positron Emission Tomography (PET)- Produces high energy, 3-D computer-reconstructed images measuring and determining the function or physiology in a specific organ, tumor, or other metabolically active site.

Picture Archiving and Communications System (PACS) - A PACS consist of workstations for interpretation; imaging modalities that gather Radiography, Fluoroscopy, Angiography, Ultrasound, Nuclear Medicine, CT, and MRI data; a web server for distribution; printers for file (which must still be generated, in limited amounts, for the use of those without access to the

network); image servers to transfer and hold information within the PACS; an archive of off-line information. A network is needed to reach each of these devices.

Scanning Rooms - "Scanning room" is a generic term used in nuclear medicine for programming purposes. The specific type of scanning equipment, i.e., gamma scintillation camera or PET camera may be included within the same area. Note that scanning is a widely used term and that there are other procedure that are not in nuclear medicine that are scanning procedures - CT Scanners, MRI are examples.

Thyroid Uptake Room - This room is specifically assigned to use isotopes to study problems of the thyroid gland.

5.4.3. POLICIES:

Radiology:

The radiology department (diagnostic radiology, radiotherapy and nuclear medicine) should be collocated.

A Cardiac Catheterization Laboratory can also perform angiography procedures. Under special study, a combined radiographic/fluoroscopic/angiographic room may be programmed for special procedures including the production of single plane angiography.

Mobile x-ray equipment storage areas will not normally be provided in the Radiology department. This equipment should be stored in the area where it is used.

5.4.4. PROGRAM DATA REQUIRED:

Diagnostic Radiology:

Use programmed workload or procedures.
Chest Procedures
Fluoroscopic Procedures
Angiographic Procedures
Mammography Procedures
Portable Procedures
Ultrasound Procedures
Computed Tomography Procedures
MRI Procedures
Total X-Ray procedures
Number of yearly intracranial procedures (neurosurgery)
Teaching facility?
Radiologic Technology Training?
Radiology residency?
Ultrasound Technology Training?
Mammography Technology Training?
Staffing (include residents and students).
Cardiac Catheterization authorized?
If yes, then how many angiographic procedures are expected to be performed by the Cardiac Catheterization lab?
MRI authorized?
Number of MRI procedures?
Total Annual RIA Procedures?
What are the number of FTEs accomplishing transcription within the radiology department?

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Radiotherapy:

Radiotherapy authorized?
Staffing (include residents and students).

Nuclear Medicine:

Total annual number of nuclear medicine procedures:
a. diagnostic procedures?
b. therapeutic procedures?
Total yearly Nuclear Medicine visits?
Staffing (include residents and students).
Total annual number of bone densitometry procedures?
Nuclear Medicine Technology Training?

Note to Programmer: A decision is required concerning the type of system that will be used in the radiology service. There are three general systems grouping, although these may be mixed. A film based system with darkrooms and film storage has been the conventional system. A totally digital system is one in which the radiology exposure device generates a digital image that can be read as a digital image or stored in digital form immediately. A computed radiology system is one in which a special cassette is substituted for the film cassette. This special cassette is then placed in a CR reader and a digital image is generated.

5.4.5. SPACE CRITERIA:

Toilets, Lounges and Locker Areas: The criteria for toilets, lounges and locker rooms is provided in a separate section, Section 6.

Administrative Offices: The office space required to provide administrative support to operate the clinic services will be provided in accordance with criteria for administration in Section 2.1.

RADIOLOGY:

FUNCTION	AUTHORIZED		PLANNING RANGE/COMMENTS
	m^2	nsf	
PATIENT AREAS			
Waiting Room	18.58	200	Hospital minimum. +80nsf for each additional Diagnostic Room greater than 3.
	9.29	100	Clinic minimum. +80nsf for each additional Diagnostic Room greater than 3.
Clinic Reception /Control Center	13.01	140	One per Radiology service. Provide an additional 140 nsf for every additional 8 FTE providers greater than 8.
Public Toilet - Male (water closet, lavatory, urinal)	11.15	120	Minimum. Add 10 NSF per male over 10. 200 nsf maximum. See Section 6.1.
Public Toilet - Female (water closet, lavatory)	9.29	100	Minimum. Add 10 NSF per female over 10. 200 nsf maximum. See Section 6.1.

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RADIOLOGY (Continued):

FUNCTION	AUTHORIZED		PLANNING RANGE/COMMENTS
	m^2	nsf	
PATIENT AREAS (Continued)			
Dressing Cubicle	4.65	50	Minimum per cubicle. 1 per Diagnostic Room.
Linen Alcove	.93	10	1 per Diagnostic Room.
Dedicated Patient Toilet (wc, lav)	5.57	60	1 per Diagnostic Room, except mammographic, angiographic and radiographic rooms. See Section 6.1.
Patient Subwaiting Area	5.57	60	1 per each radiographic exposure room.
STAFF AND SUPPORT AREAS			
Provider's Office	11.15	120	One per provider FTE programmed.
NCOIC/LCPO/LPO	11.15	120	1 per clinic.
Clinic Conference / Classroom	20.90	225	One per clinic.
Litter and Wheelchair Storage	2.32	25	1 per Diagnostic Room.
Clean Supply & Equipment Area	9.29	100	Minimum per department. Provide a minimum of 100 nsf or 40 nsf per diagnostic room, whichever is greater, in a combined clean supply & equipment room. Maximum of 200 nsf.
Soiled Utility	11.15	120	One per clinic.
Dedicated Radiology Janitors' Closet	5.57	60	One for 10,000 nsf or one for radiology dept., whichever is greater. See Section 6.1.
Staff Radiologist	11.15	120	One per programmed FTE Radiologist.
Clerical	5.57	60	Minimum. 60 nsf per clerical FTE programmed.
Quality Assurance	9.29	100	One when FTE programmed.
Mammography Scheduler/Tracking Office	9.29	100	One per radiology clinic with mammography services.
Transcription work area	5.57	100	Minimum, if one per FTE programmed. Provide 60 nsf for each FTE if greater than one.
Staff Lounge	13.01	140	Minimum. Add 10 NSF per each FTE staff over 10. 200 NSF maximum.
Staff Locker Rooms:			
Male	9.29	100	Minimum. See Section 6.1.
Female	9.29	100	Minimum. See Section 6.1.
Staff Toilets:			
Male	5.57	60	Minimum. See Section 6.1.
Female	5.57	60	Minimum. See Section 6.1.

Radiology and Nuclear Medicine

RADIOLOGY (Continued):

FUNCTION	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
DIAGNOSTIC ROOMS			
Xray, Radiographic	29.73	320	Space per general radiology room. see formula section 5.4.6 to determine number of rooms.
Xray, Radiographic/Fluoroscopic	29.73	320	Per room authorized.
Dedicated Toilet	5.57	60	One per Radiographic/Fluoroscopic room.
Xray, Angiographic	54.72	590	Per room authorized.
Patient Prep Cubicle	11.15	120	Two per angiographic room.
Angiographic/Procedure Room	83.61	900	Special justification required. To be used only when the angiographic room will also be used for procedures.
Control Room	9.29	100	Minimum. Add 80 nsf per exposure room over one.
Mammographic	11.15	120	Space per mammography room. See formula section 5.4.6 to determine number of rooms.
Mammographic Processing Room	10.4	110	Minimum of one. One per 1-2 mammographic rooms.
Ultrasound	16.72	180	Space per ultrasound room. See formula section 5.4.6 to determine number of rooms.
Dedicated Ultrasound Toilet	5.57	60	One per ultrasound room.
COMPUTED TOMOGRAPHY			
CT Scanning Room	27.87	300	Space per each scanning room. See formula section 5.4.6 to determine number of suites.
Control Room	11.15	120	One per scanning room. Includes computer equipment.
Independent Display Console	11.15	120	One per scanning room.
Sub-waiting	5.57	60	One per scanning room.
Patient Prep Cubicle	11.15	120	One per scanning room.
Med Prep.	5.57	60	One per scanning room.

RADIOLOGY (Continued):

FUNCTION	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
MAGNETIC RESONANCE IMAGING (MRI)			
PATIENT AREAS			
Reception/ Administration	9.29	100	One per MRI suite.
Scanning Room	46.46	500	Space per scanning room. See formula section 5.4.6 to determine number of suites.
Computer Room	13.94	150	One per scanning room.
Control Room	9.29	100	One per scanning room.
Dressing Booth	4.65	50	Provide 2 booths per scanning room.
Sub-waiting	5.57	60	One per every two scanning room.
Patient Toilet	5.57	60	One per every two scanning room.
STAFF AND SUPPORT AREAS			
Physician's Viewing Room	13.94	150	One per MRI suite.
MRI Gas Storage (Cryogen Storage)	5.57	60	One per MRI suite.
Equipment Room	26.01	280	One per MRI suite.
Litter Storage Alcove	3.72	40	One per MRI suite.
Soiled Linen Alcove	.93	10	One per MRI suite.
Storage	3.72	40	One per MRI suite.
Darkroom	11.15	120	1 per radiology service. Includes replenisher tanks storage. Required if any conventional (film based) radiology is included.
Film Sorting Area	13.94	150	1 area per darkroom.
Film Files/Work Area	23.23	250	Minimum of 1 per radiology service. Required if any conventional (film based) radiology is included. Add 50 nsf for each "film" exposure room in excess of four.
Computed Radiology Reader Area	11.15	120	1 per radiology service with computed radiology.
Film Storage	16.72	180	Minimum. 180 nsf or 1 NSF per every 10 patient records maintained, whichever is greater. Provide for non-digital radiology service only.
Digital Quality Control Station	11.15	120	1 per radiology service using digital or computed radiology.
Digital Image Storage	18.58	200	200 nsf minimum or provide 10 nsf per exposure unit. This may be located in Section 2.4: Information Management. Locate in either 2.4 or 5.4, but not in both departments.
Viewing/Consultation:			Size of viewing area is the same for film or digital viewing.
Non-teaching	11.15	120	Minimum. Provide one per two exposure rooms.
Teaching	23.23	250	Minimum or 60 NSF per exposure room, whichever is greater.
Tele-Radiology	20.90	225	Justification required. Add additional 100 nsf if separate computer workroom required.

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RADIOLOGY (Continued):

FUNCTION	AUTHORIZED		PLANNING RANGE/COMMENTS
	m^2	nsf	
TEACHING SUPPORT			Space provided only if the medical facility has an authorized radiology residency.
Director of Radiology Residency	11.15	120	One per director of radiology residency program.
Secretary to Director with visitor waiting.	11.15	120	One per Director of Radiology Residency program, if there is a programmed FTE secretary position.
Residency Research Technician	11.15	120	One per program, when there is a programmed FTE position.
Radiology Residency Coordinator	11.15	120	One per Radiology Residency Program Coordinator if there is a programmed FTE.
Radiology Resident's Office Space	11.15	120	Minimum. 60 nsf per programmed resident.
Instructor Office	11.15	120	Residency Program Required, one per FTE programmed. Residency program and/or Phase II technician teaching program required.
Technician Training Office	11.15	120	Residency Program Required, one per FTE programmed. Phase II training program required.
Teaching Files	27.87	300	Residency Program Required.
Residency Library	22.29	240	One per Residency Program.
On Call Room	11.15	120	Residency Program Required.
Toilet (wc, lavatory, shower).	8.36	90	Minimum. See Section 6.1.
Conference Room	37.16	400	One per Radiology Residency Program. Residency program and/or Phase II technician teaching program required.
Resident/Phase II Locker Room		varies	See Section 6.1. Residency program and/or Phase II technician teaching program required.

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RADIOTHERAPY:

FUNCTION	AUTHORIZED		PLANNING RANGE/COMMENTS
	m^2	nsf	
PATIENT AREAS			
Reception/Control	13.01	140	One per Radiotherapy service.
Waiting Room "Hot"	11.15	120	Minimum. Add 40 nsf for every Treatment room, Simulator and Therapy Planning room in excess of 3.
Waiting Room "Cold"	11.15	120	Minimum. Add 40 nsf for every Treatment room, Simulator and Therapy Planning room in excess of 3.
Examination Room	11.15	120	Minimum of 2 for up to 200 new patients per year. Add 1 room for each additional 200 new patients per year.
Public Toilet - Male (water closet, lavatory)	5.57	60	Minimum See Section 6.1.
Public Toilet - Female (water closet, lavatory)	5.57	60	Minimum See Section 6.1.
Sub-waiting	7.43	80	If used, subtract 80 NSF from the total waiting area for Radiation therapy area. Place adjacent to the treatment spaces.
Dressing Cubicle	4.65	50	2 per treatment or simulator room.
Soiled Linen Alcove	.93	10	1 per examination room.
STAFF AND SUPPORT AREAS			
Provider's Office	11.15	120	One per provider FTE programmed.
NCOIC/LCPO/LPO Office(s)	11.15	120	2 NCOIC's: one for radiation oncology and one for medical physics, if FTEs programmed.
Resident Offices	11.15	120	1 per programmed trainee.
Staff Radiotherapists	11.15	120	1 per radiotherapist programmed.
Physicist Office	11.15	120	One office per physicist FTE.
Nurse Manager's Office	11.15	120	1 per nurse manger FTE programmed.
Chief Technician	11.15	120	1 per senior technician FTE programmed.
Clerical	5.57	60	Minimum. 60 nsf per clerical FTE programmed.
Dosimetrist Workroom	27.87	300	1 per radiation therapy service if a radiation oncologist FTE programmed.
Radiology Safety Files	9.29	100	Minimum per radiology service. Add 20 nsf for each physicist FTE.
Patient Record Storage	16.72	180	Minimum. 180 nsf or 1 NSF per every 10 patient records maintained, whichever is greater.
Equipment Storage	11.15	120	1 per clinic.
Film File Room	16.72	180	One per radiation therapy service.
Viewing/Consultant	16.72	180	1 per clinic.
Staff Lounge	13.01	140	Minimum. Add 10 NSF per FTE staff over 10. 200 NSF max.

RADIOTHERAPY (Continued):

FUNCTION	AUTHORIZED m^2	AUTHORIZED nsf	PLANNING RANGE/COMMENTS
STAFF AND SUPPORT (Continued)			
Staff Locker Rooms		varies	See Section 6.1.
Staff Toilets		varies	See Section 6.1.
Clinic Conference / Classroom	20.90	225	One per clinic.
Litter and Wheelchair Storage	5.57	60	One per clinic.
Soiled Utility	11.15	120	1 per clinic.
Clean Utility	5.57	60	1 per clinic.
Janitors' Closet	5.57	60	One for 10,000 nsf or one for radiotherapy dept., whichever is greater. See Section 6.1.
TREATMENT ROOMS			Requires special approval. Number and type of treatment rooms will be determined on an individual basis.
Linear Accelerator:	55.74	600	Justification required for this service.
Control Area	12.08	130	One per linear accelerator.
Entrance Maze	13.01	140	One per linear accelerator. *Note: Maze design may be omitted with the use of a specifically designed, shielded sliding door.*
Auxiliary Equipment Room	12.08	130	Control Area 130 Control area has same comments as above except control has more electronics and a computer CPU.
Simulator:	37.16	400	Justification required for this service.
Control area	10.22	110	Control area needed for scanning fluoro. as well as personnel protection. Space needed for computer console and CPU.
TREATMENT SUPPORT			
Treatment Planning Room	23.23	250	One per simulator service.
Brachytherapy Room	11.15	120	One per suite.
Radiologic Physics Lab	27.87	300	One per suite.
Film Processing	11.15	120	One per radiologic physics lab.
Workroom/Mold Fabrication	20.44	220	One per physics lab.
Image Support:			
Non-teaching	11.15	120	Minimum. Provide one per two exposure rooms.
Teaching	23.23	250	Minimum or 60 NSF per exposure room, whichever is greater.
Tele-Radiology	20.90	225	Justification required. Add additional 100 nsf if separate computer workroom required.

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NUCLEAR MEDICINE:

FUNCTION	AUTHORIZED		PLANNING RANGE/COMMENTS
	m^2	nsf	
PATIENT AREAS			
Waiting Room "Hot"	9.29	100	Minimum. Add 16 nsf for each additional imaging room above six.
Public Toilet – Unisex (water closet, lavatory)	5.57	60	Minimum See Section 6.1. One per "Hot" waiting area.
Waiting Room "Cold"	11.15	120	Minimum. Add 16 nsf for each additional imaging room above six.
Public Toilet Unisex (water closet, lavatory)	5.57	60	Minimum See Section 6.1. One per "Cold" waiting area.
Patient Holding Alcove	9.29	100	1 per clinic.
Dressing Cubicle	4.65	50	1 per 4 imaging rooms. Minimum of 1 cubicle.
Patient toilet (wc, lav., shower)	5.57	60	2 per clinic. Design as hot toilet.
SCANNING ROOMS			Special Study Required to Justify.
General Scanning	33.45	360	Collimator cart storage included
Special Scanning	37.16	400	This space is adequate for dynamic cardiac studies and tomographic systems.
STAFF AND SUPPORT AREAS			
Provider's Office	11.15	120	One per provider FTE programmed.
NCOIC/LCPO/LPO	11.15	120	1 per clinic.
Resident Office	11.15	120	1 per programmed trainee.
Nuclear Med. Physician Office	11.15	120	One per FTE programmed.
Director, Radio-immunoassay Laboratory Office	11.15	120	For labs performing over 30,000 procedures per year.
Physicist Office	11.15	120	1 per clinic with 4 or more scanning rooms.
Radio-pharmacist Office	11.15	120	One per FTE programmed.
Chief Technician	9.29	100	One per clinic when FTE programmed.
Secretary, Visitor Waiting	11.15	120	Special justification required for more than one.
Clerical	5.57	60	Minimum. 60 nsf per FTE programmed.
Records/Film Storage	16.72	180	Minimum. 180 nsf or 1 NSF per every 10 patient records maintained, whichever is greater.
Clinic Conference / Classroom	13.94	150	NSF minimum. or 20 per Nuclear Med. officer FTE programmed. For small clinics (less than 3 officers assigned), function could be met by adding 40 nsf to Lounge.
Clean Supply & Equipment Area	9.29	100	Minimum per department. Provide a minimum of 100 nsf or 40 nsf per diagnostic room, whichever is greater, in a combined clean supply & equipment room. Maximum of 200 nsf.

NUCLEAR MEDICINE (Continued):

FUNCTION	AUTHORIZED		PLANNING RANGE/COMMENTS
	m^2	nsf	
STAFF AND SUPPORT AREAS (Continued)			
Hot locker/Dose Calibration	9.29	100	1 per clinic. Provide only if there is no radiopharmacy in the facility.
Soiled Utility	11.15	120	One per clinic.
Equipment Storage	18.58	200	One per scanning room.
Staff Lounge	13.01	140	Minimum. 200 maximum. Add 10 NSF per FTE staff over 10.
Staff Toilets		varies	See Section 6.1.
Staff Showers		varies	Combine with toilets. See Section 6.1.
Staff Lockers:			See Section 6.1.
Male	9.29	100	Minimum. See Section 6.1.
Female	9.29	100	Minimum. See Section 6.1.
Litter and Wheelchair Storage	4.65	50	1 per clinic.
Dedicated Nuclear Medicine Janitors' Closet	5.57	60	One for 10,000 nsf or one for Nuclear Medicine, whichever is greater. See Section 6.1.
NUCLEAR MEDICINE SERVICES			Special study required to justify.
PET-CT	41.81	450	Per PET or PET-CT unit.
PET injection/waiting room (quiet room)	11.15	120	One per PET Service. Two reclining chairs and injection storage area.
PET Dedicated Lab.	11.15	120	One per PET Service.
Uptake Room	15.61	170	1 per clinic
Radiopharmacy	18.58	200	1 per clinic, add 100 NSF at Medical Centers.
Treatment Room	13.94	150	1 per clinic.
Injection room/ Venipuncture/ Dosing/Specimen collection	13.94	150	1 per clinic.
Decay Storage Area	11.15	120	1 per clinic.
Film Sorting/ Reading	9.29	100	1 per clinic.
Computer Room	23.23	250	1 per clinic.
Crash Cart	1.86	20	1 per clinic.
Clean Cart Holding	1.86	20	1 per clinic.
Soiled Cart Holding	1.86	20	1 per clinic.
TREATMENT AREAS			
Treadmill Room	20.44	220	1 per clinic.

Radiology and Nuclear Medicine

5.4.6. FORMULAS:

Column A	Column B	Column C	Column D	Column E	Column F
Imaging Technology	**Utilization Hours per Year**	**Studies per Hour**	**Ideal Number of Patients per Year**	**Average Military Hospital Patients per Year**	**Utilization Rate**
Normal Radiography	3,000	4	12,000	**22,000**	1.8
Fluoroscopy	1,250	1	1,250	**900**	0.8
Mobiles and Portables	2,000	2.5	5,000	**1,300**	1.4
Ultrasound	2,000	1.33	2,660	**3,600**	1.4
CT	4,992	2	9,984	**1,800**	0.2
MRI	4,992	1	4,992	**600**	0.1
Lone Radiology Unit in a Free Standing Clinic	2,000	1	2,000	**1,300**	0.7
Gamma Cameras	N.A.	N.A.	N.A.	**1,150 studies**	N.A.

Note: the CT and MRI are based on more than the normal duty day. This assumes a minimum of two shifts per day and one on Saturday and Sunday. Straight radiology is based on more than an 8-hour day also.

Calculation Method: Select the imaging technology for which you desire to calculate the number required. Project the annual number of patient visits. Divide the annual number of visits by the appropriate number of military treatment facility visits per year (Bold Column Above, Column E). Do not round up for free standing clinics if supported by a hospital in the area. Do round up for a hospital's second or more item and if additional item is more than 50% justified. First item must be justified by attainment of 80% of desired patient visits.